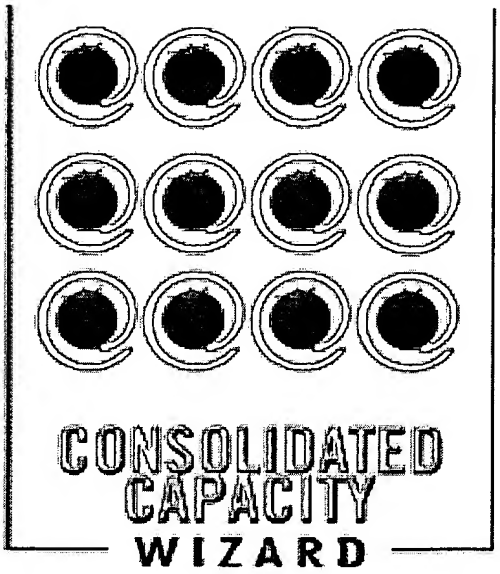
Appendix E



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Introduction

The current capacity planning report was based on data collected in the host ACMEsrv01 and ACMEsrv02, from 07/27/2001, at 13:00, to 08/08/2001, at 23:00.

The data used in this report has been obtained from an exclusive collector, which executes on the target machine, with high resolution and low intrusion, specially developed for this purpose.This collector obtains data directly from the operating system, without any other libraries or additional tools, with a minimum overhead on the system. The data collected is stored using a binary format, in order to provide persistence. When automatically sent, it is compressed and encrypted, to ensure fast delivery and confidentiality.

The content of this report is based on years of experience in performance analysis and capacity planning. The tool used to generate this report operates in a completely automatic way, without direct human intervention. It uses an extensible inference machine, based on heuristics and rules, improved continuously. Using concepts such as "watermarks" and tolerance, it is possible to determine if a computational resource usage is excessive and if the excess is relevant.

Summary

The table below represents the status of the machines analyzed in this report. The red square indicates that the machine has already exceeded the saturation limit. The black square indicates that the saturation limit will be exceeded in the future horizon considered. Click on the square to observe the corresponding graph.

	Processor	Memory	Disk	Disk I/O	Network
ACMEsrv01	■		■	■	■
ACMEsrv02		■	■		

The CPU utilization for machine ACMEsrv01 is saturated. The CPU recommendation is exchanging this model for 6 Compaq Proliant ML750 2048 machines, with 7 CPUs each (tpm = 446390.7 total).

The memory utilization for machine ACMEsrv02 will become saturated in the future horizon of 300 days. The memory recommendation is to add 1473 MB memory.

The disk space utilization for machine ACMEsrv01 is saturated. The disk space recommendation is to add at least another 52.6 GB of disk space.

The disk space utilization for machine ACMEsrv02 will become saturated in the future horizon of 300 days. The disk space recommendation is to add at least another 6.3 GB of disk space.

The disk I/O utilization for machine ACMEsrv01 is saturated. The disk I/O recommendation is an upgrade to 12 disks, spreading the load among them.

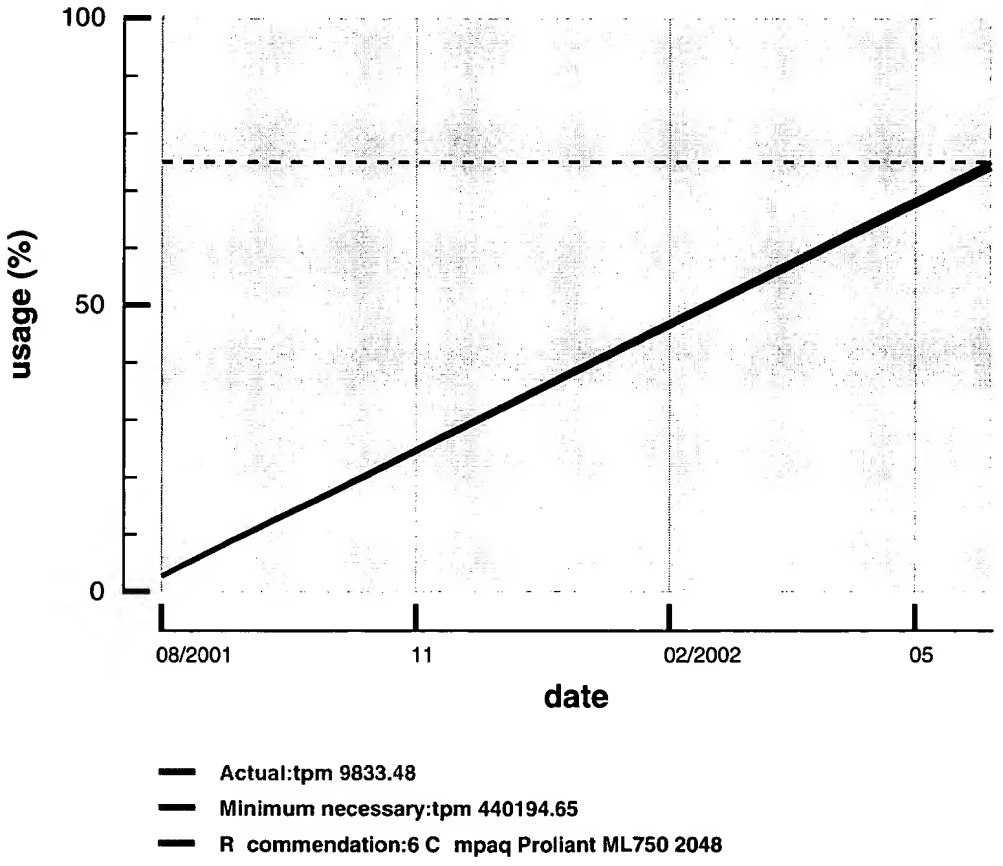
The network utilization for machine ACMEsrv01 will become saturated in the future horizon of 300 days. The network recommendation is to add 2 network adaptors, each one with a 100 Mb/s capacity.

CPU Usage

Machine ACMEsrv01 presented CPU saturation during the monitored period. The future horizon considered is of 300 days. Utilization grew 3763.3% per month. The accountability of this projection is of 60.9%.

To keep CPU utilization below the limit of 75%, an upgrade of 4376.5% is necessary.

The CPU recommendation is exchanging this model for 6 Compaq Proliant ML750 2048 machines, with 7 CPUs each (tpm = 446390.7 total).

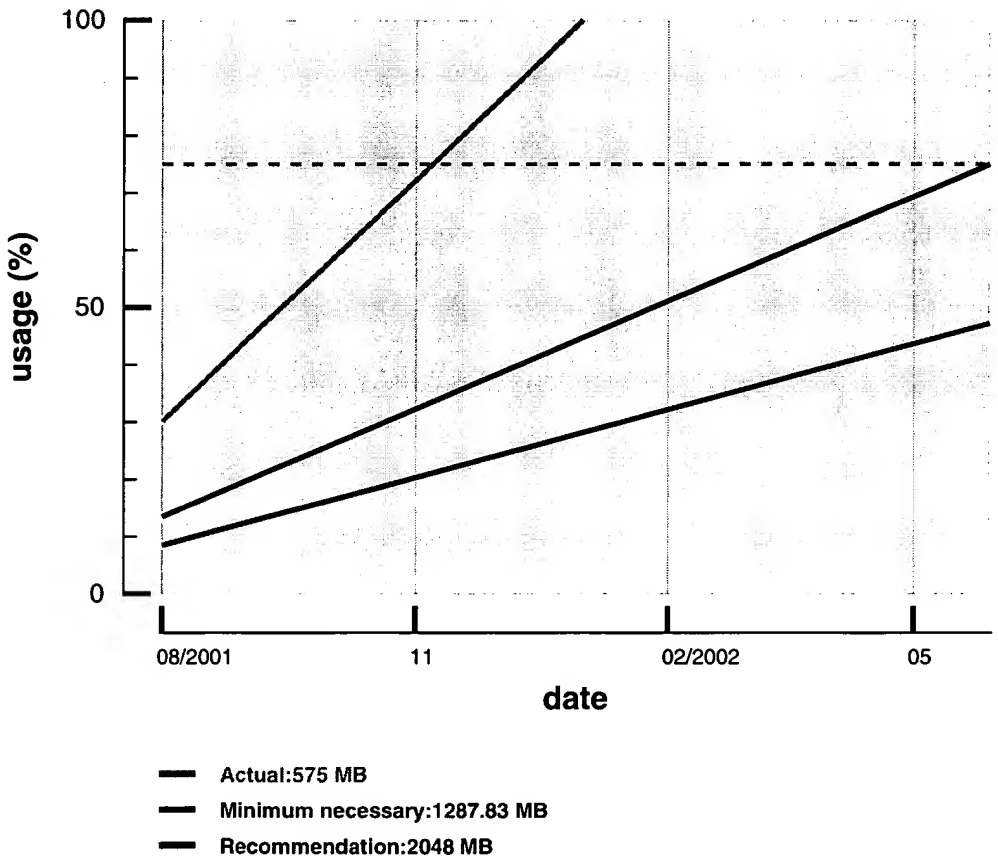


Memory

Machine ACMEsrv02 presented memory saturation in the future horizon of 300 days. Utilization grew 40.1% per month. The accountability of this projection is of 97.8%.

To keep memory utilization below the limit of 75%, an upgrade of 124% is necessary.

The memory recommendation is to add 1473 MB memory.

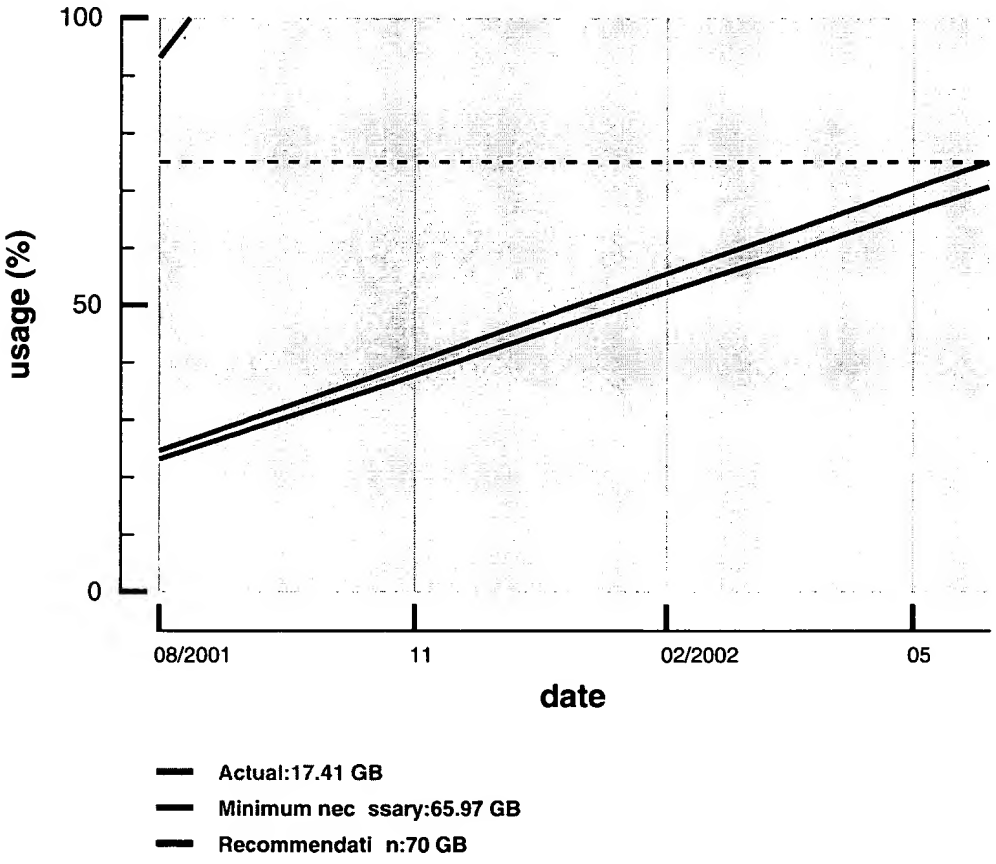


Disk Occupation

Machine ACMEsrv01 presented disk space saturation during the monitored period. The future horizon considered is of 300 days. Utilization grew 19% per month. The accountability of this projection is of 94.6%.

To keep disk space utilization below the limit of 75%, an upgrade of 279% is necessary.

The disk space recommendation is to add at least another 52.6 GB of disk space.

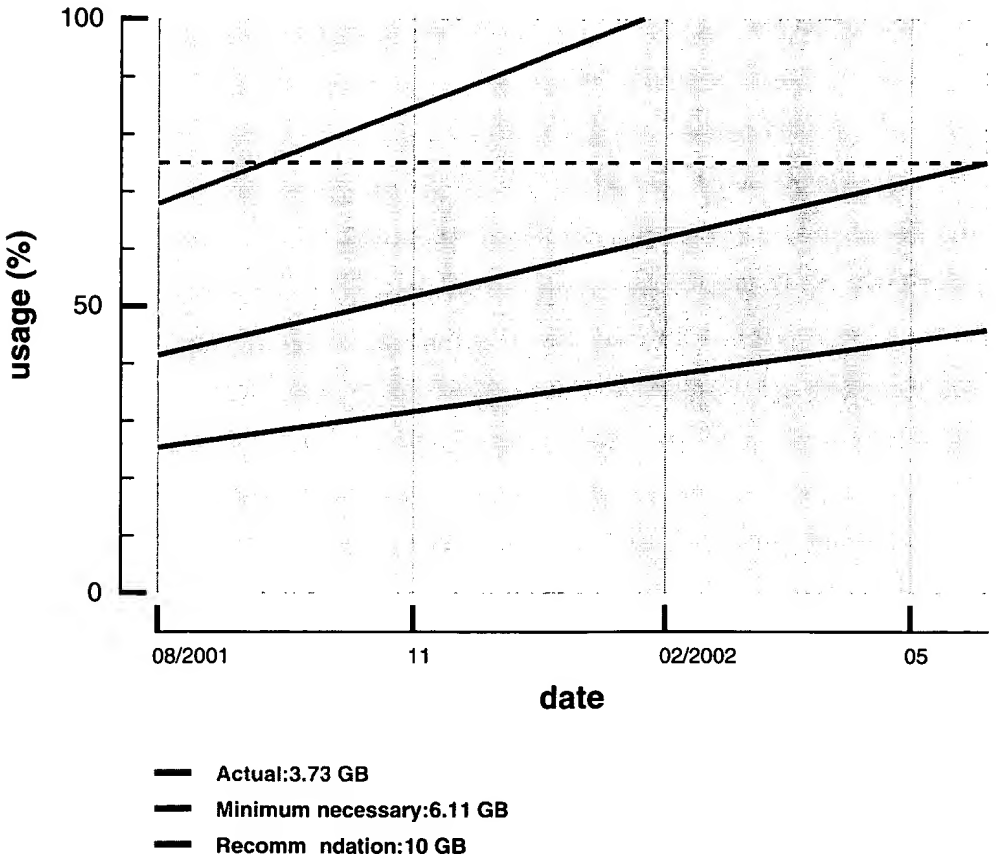


Disk Occupation

Machine ACMEsrv02 presented disk space saturation in the future horizon of 300 days. Utilization grew 6.6% per month. The accountability of this projection is of 99.6%.

To keep disk space utilization below the limit of 75%, an upgrade of 63.7% is necessary.

The disk space recommendation is to add at least another 6.3 GB of disk space.

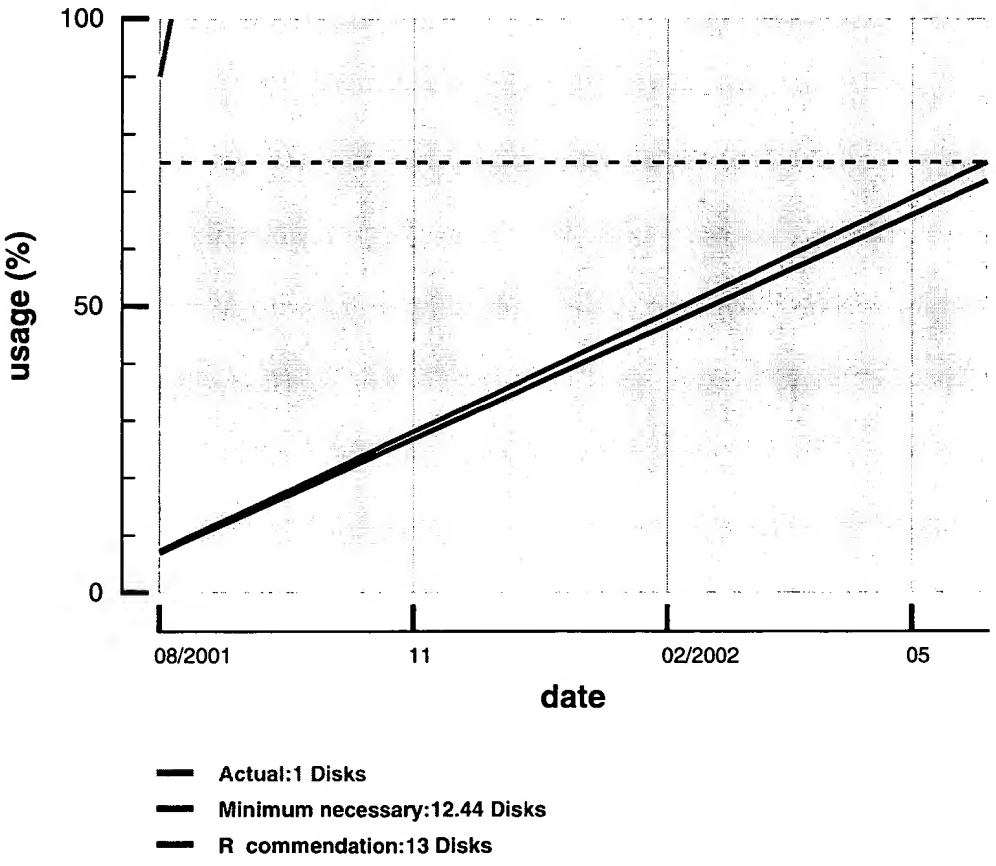


Disk I/O

Machine ACMEsrv01 presented disk I/O saturation during the monitored period. The future horizon considered is of 300 days. Utilization grew 124.5% per month. The accountability of this projection is of 64.2%.

To keep disk I/O utilization below the limit of 75%, an upgrade of 1144% is necessary.

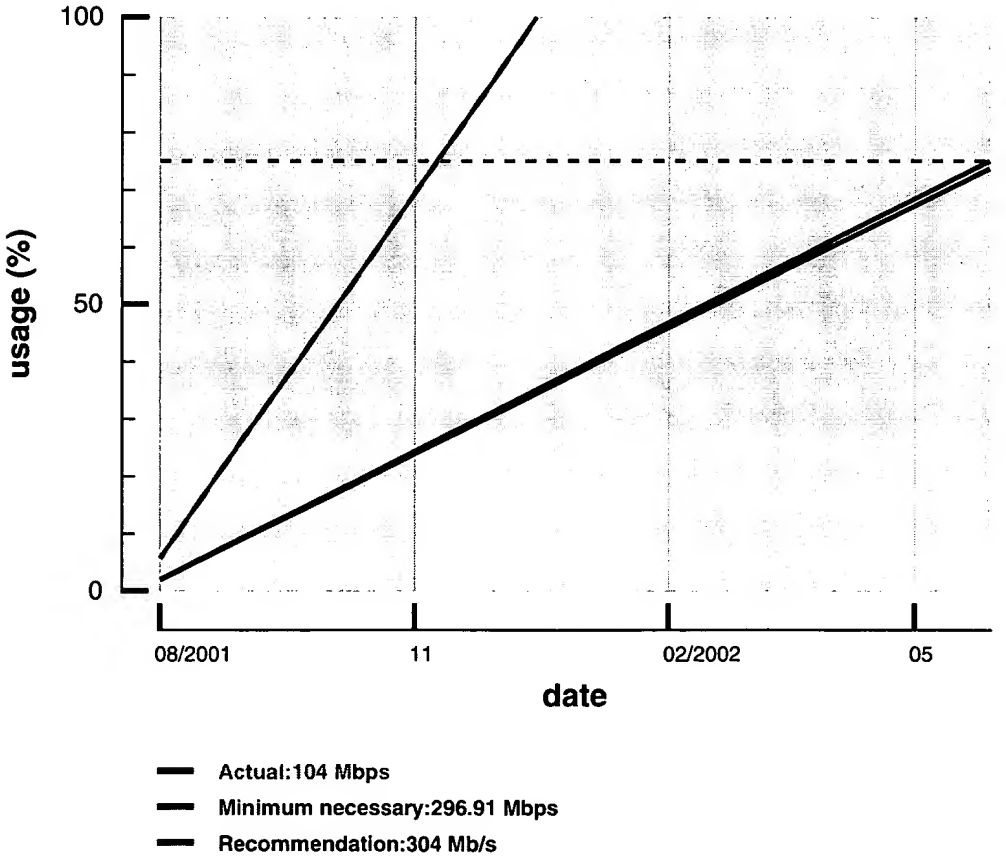
The disk I/O recommendation is an upgrade to 12 disks, spreading the load among them.



Machine ACMEsrv01 presented network saturation in the future horizon of 300 days. Utilization grew 976.8% per month. The accountability of this projection is of 93.3%.

To keep network utilization below the limit of 75%, an upgrade of 185.5% is necessary.

The network recommendation is to add 2 network adaptors, each one with a 100 Mb/s capacity.

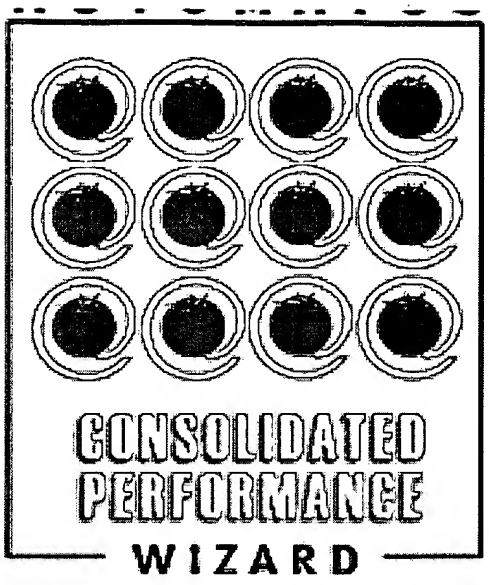


List of Machines

Name	Model	Processor	Number of CPUs	Clock (Mhz)	Memory (MB)	OS	Version
ACMEsrv01		Pentium III (Coppermine)	1	728	191	Win2000	0.0.5
ACMEsrv02		Pentium III (Coppermine)	1	728	575	Win2000	0.0.5

Performance Indicators

Name	Nominal SPECint95	Used SPECint95	Nominal TPMC	Used TPMC	Total Memory (MB)	Used Memory (MB)	Total Disk Space (GB)	Used Disk Space (GB)
ACMEsrv01	321.3	320.4	9,833.4	9,806.9	191	644	17	16
ACMEsrv02	321.3	160.4	9,833.4	4,910.8	575	178	3	2
Total	**642.6**	**480.8**	**19,666.9**	**14,717.7**	**766**	**822**	**20**	**18**



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Performance Indicators

Introduction

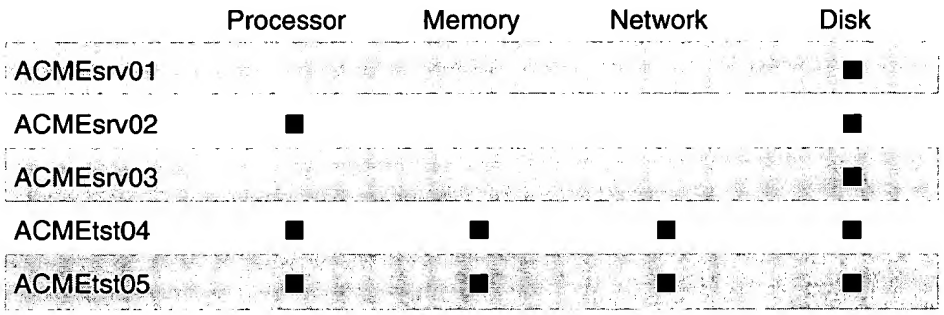
The current performance analysis report was elaborated based on data collected in the host ACMEsrv01, ACMEsrv02, ACMEsrv03, ACMEtst04 and ACMEtst05, from 06/15/2001, at 00:00, to 06/19/2001, at 23:00.

The data used in this report has been obtained from an exclusive collector, which executes on the target machine, with high resolution and low intrusion, specially developed for this purpose.This collector obtains data directly from the operating system, without any other libraries or additional tools, with a minimum overhead on the system. The data collected is stored using a binary format, in order to provide persistence. When automatically sent, it is compressed and encrypted, to ensure fast delivery and confidentiality.

The content of this report is based on years of experience in performance analysis and capacity planning. The tool used to generate this report operates in a completely automatic way, without direct human intervention. It uses an extensible inference machine, based on heuristics and rules, improved continuously. Using concepts such as "watermarks" and tolerance, it is possible to determine if a computational resource usage is excessive and if the excess is relevant.

Summary

The chart below represents a summary of the situation of the machines analysed in this report. The red square indicates that a machine has exceeded, on average, the threshold. The black square indicates that only maximum values exceeded the treshold. Click on the square to see the corresponding graph.



Machine ACMEsrv02 reached a maximum consumption of 80%, exceeding the limit of 75%.

Machine ACMEtst04 reached a maximum consumption of 96.8%, exceeding the limit of 75%.

Machine ACMEtst05 reached a maximum consumption of 93.3%, exceeding the limit of 75%.

Machine ACMEtst04 reached a maximum paging rate of 10.2 pg/sec, exceeding the limit of 10 pg/sec.

Machine ACMEtst05 reached a maximum paging rate of 25.8 pg/sec, exceeding the limit of 10 pg/sec.

Machine ACMEtst04's network devices reached the maximum reception level of 84.5%, exceeding the limit of 70%.

Machine ACMEtst05's network devices reached the maximum transmission level of 91%, exceeding the limit of 70%.

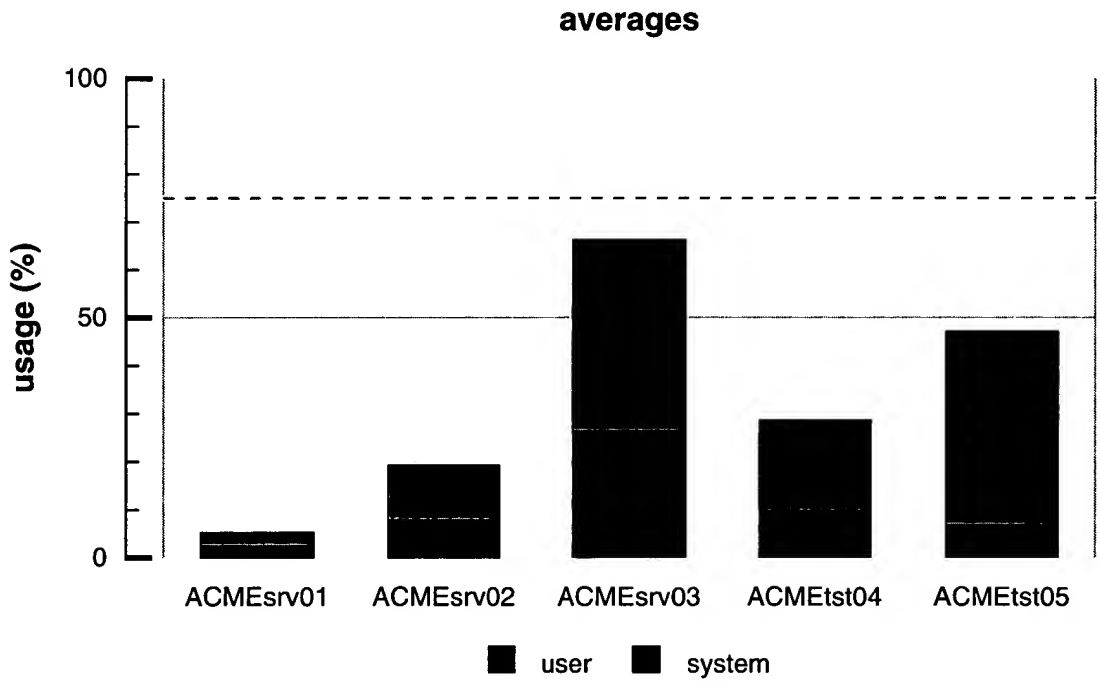
Machine ACMEsrv03 reached a maximum disk time active of 57.8%, exceeding the limit of 40%.

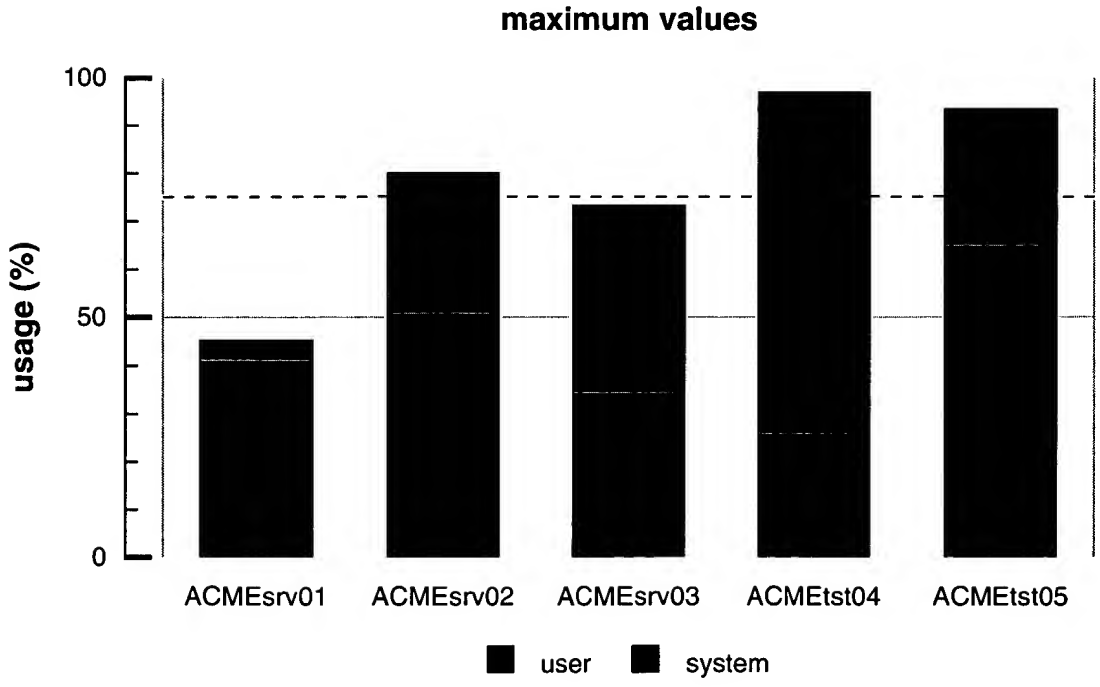
Machine ACMEsrv02 registered an average disk occupation of 75%, exceeding the limit of 70%.

Machine ACMEtst04 registered an average disk occupation of 89.1%, exceeding the limit of 70%.

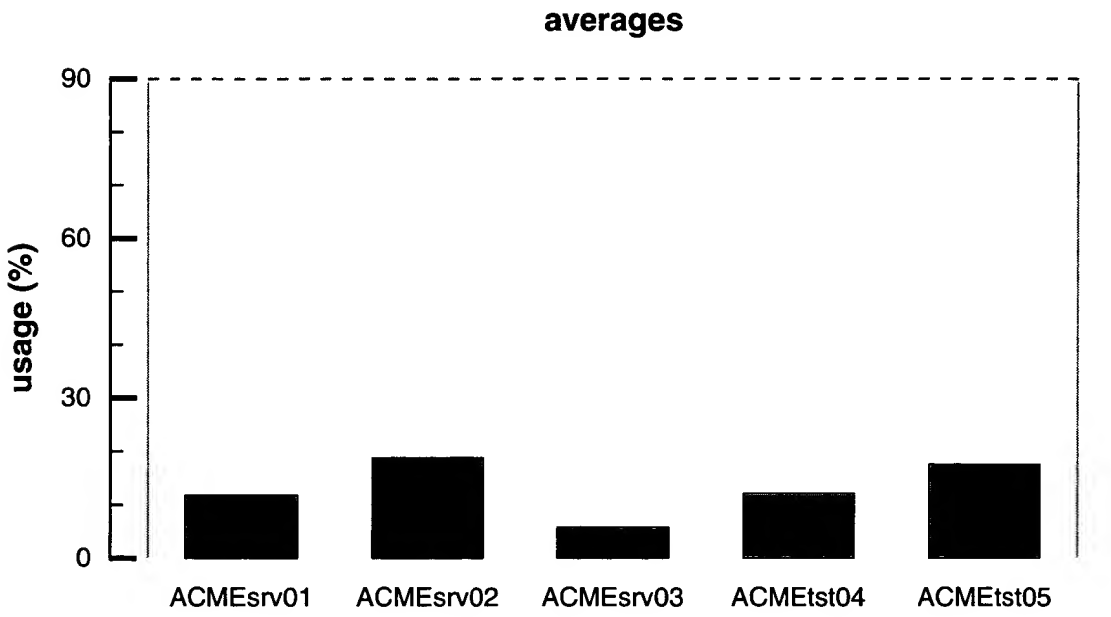
Machine ACMEtst05 registered an average disk occupation of 89.4%,

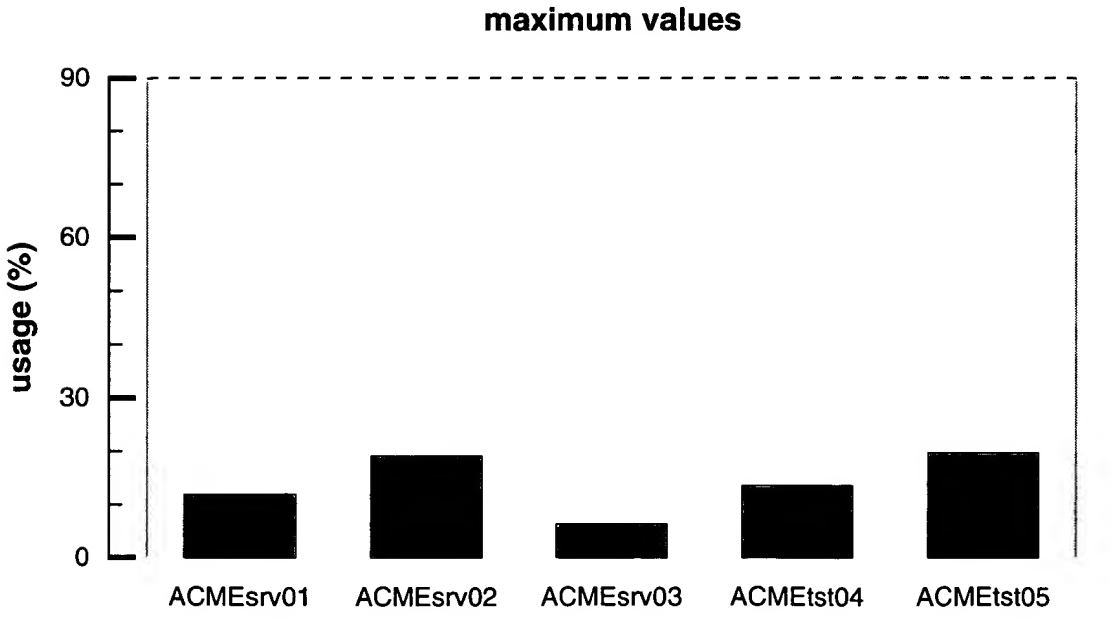
Below, each pair of graphs represents the average and maximum values for CPU consumption in the specified period, subdivided in user and system modes.



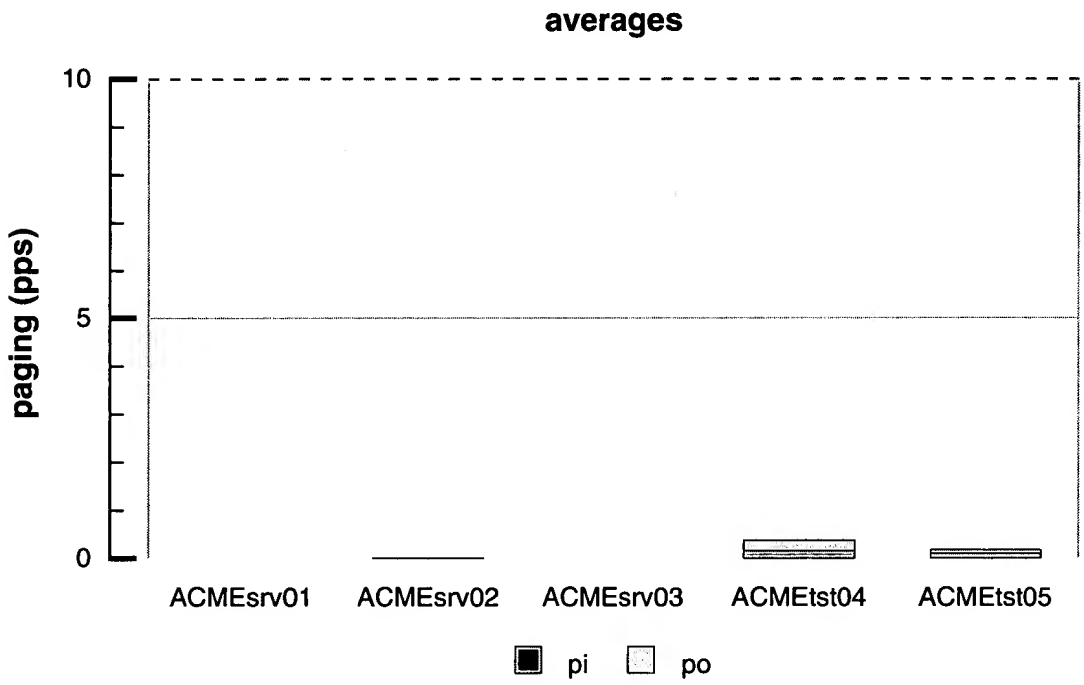


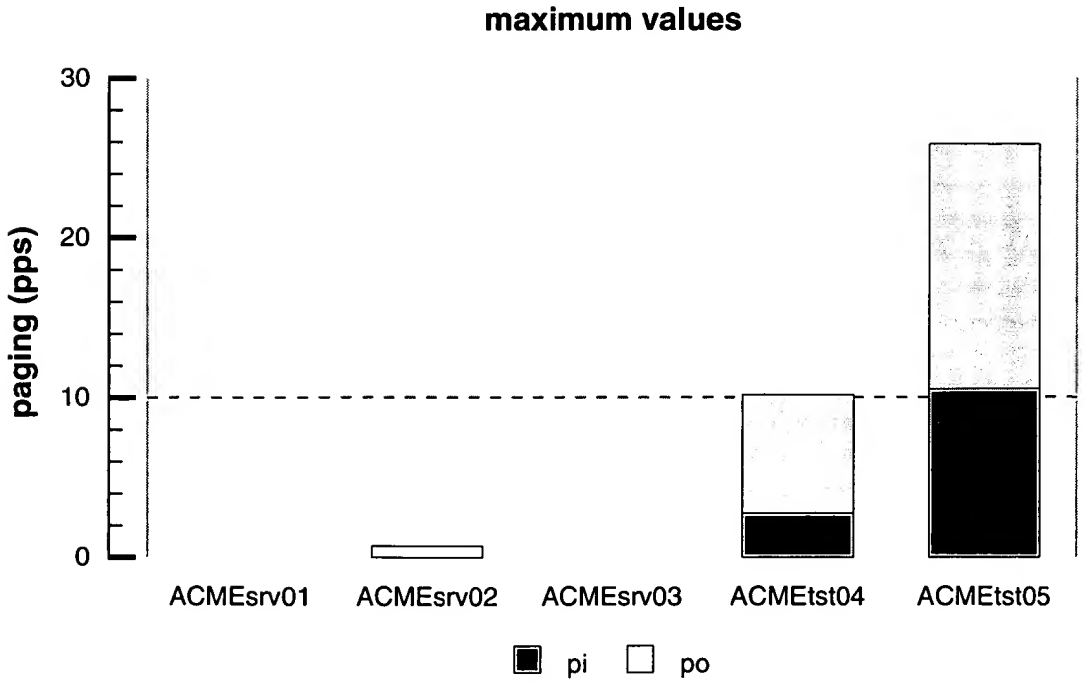
Each pair of graphs below represents the average and maximum values for memory consumption in the specified period.



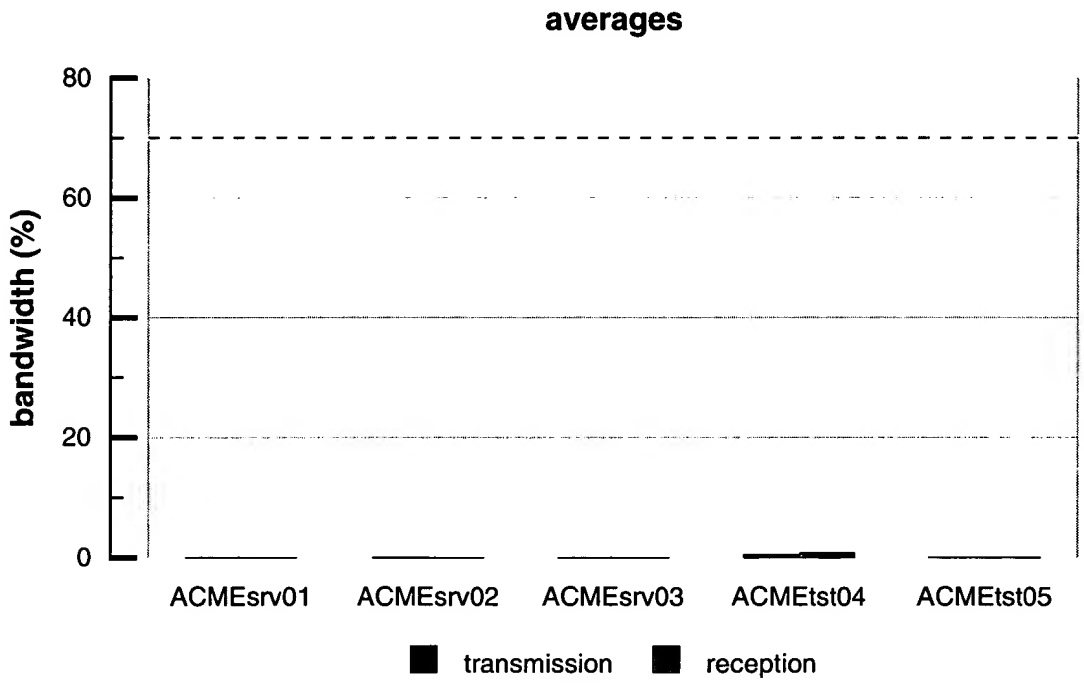


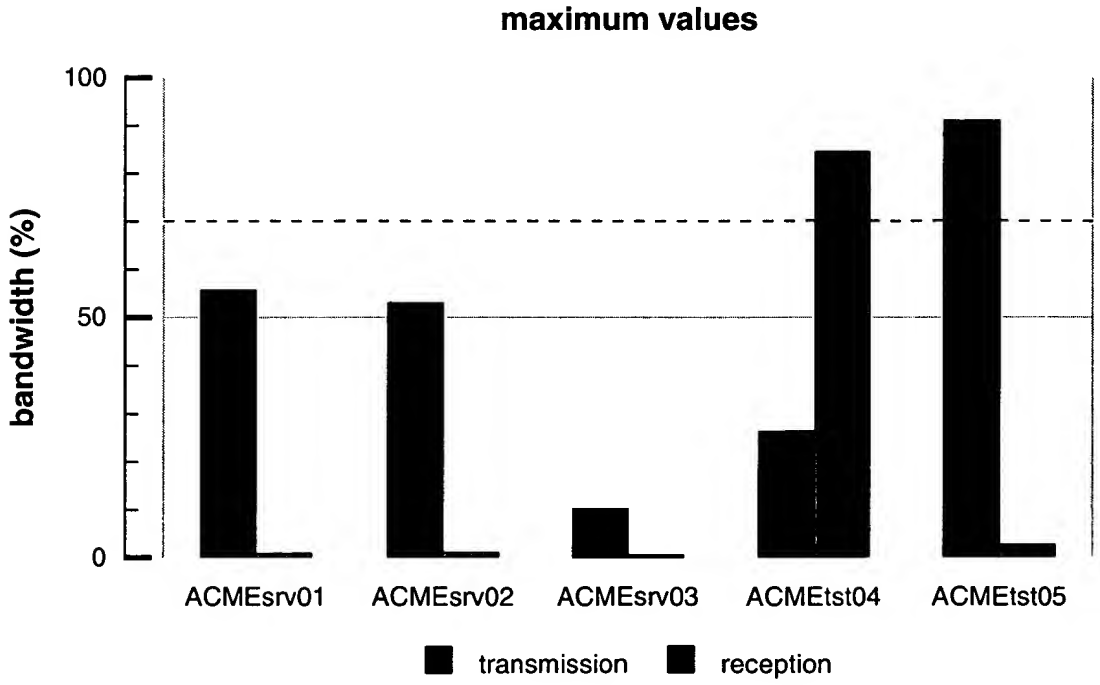
Each pair of graphs below shows the average and maximum paging rates for the period, subdivided in page in and page out.





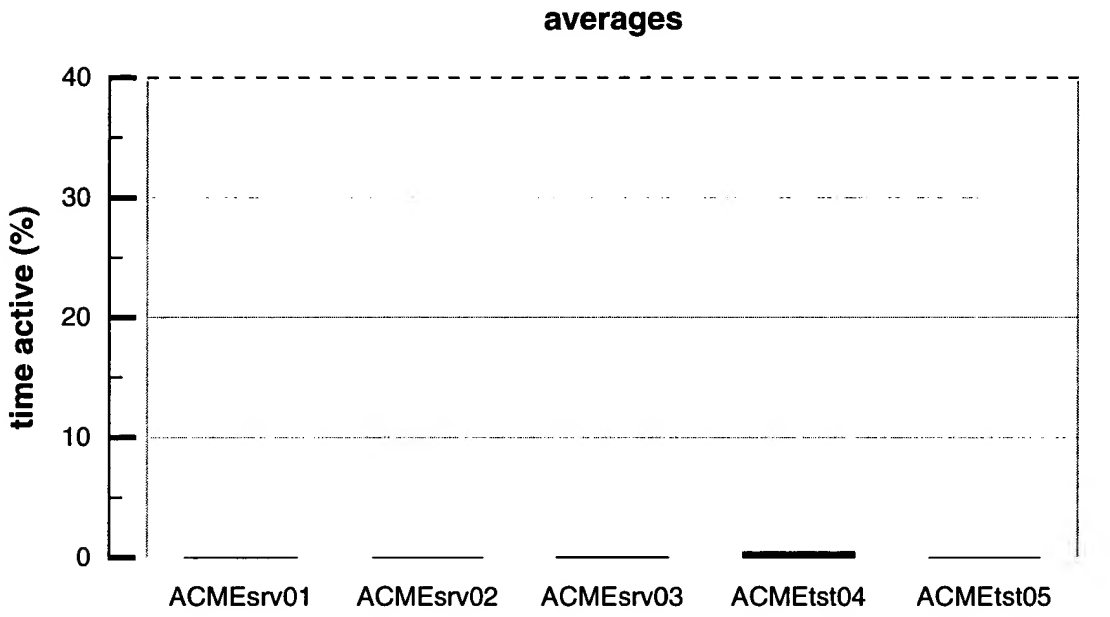
Each pair of graphs below represents the maximum and average values for the network traffic in the period. Loopback interfaces were not taken into account, only transmission and reception.

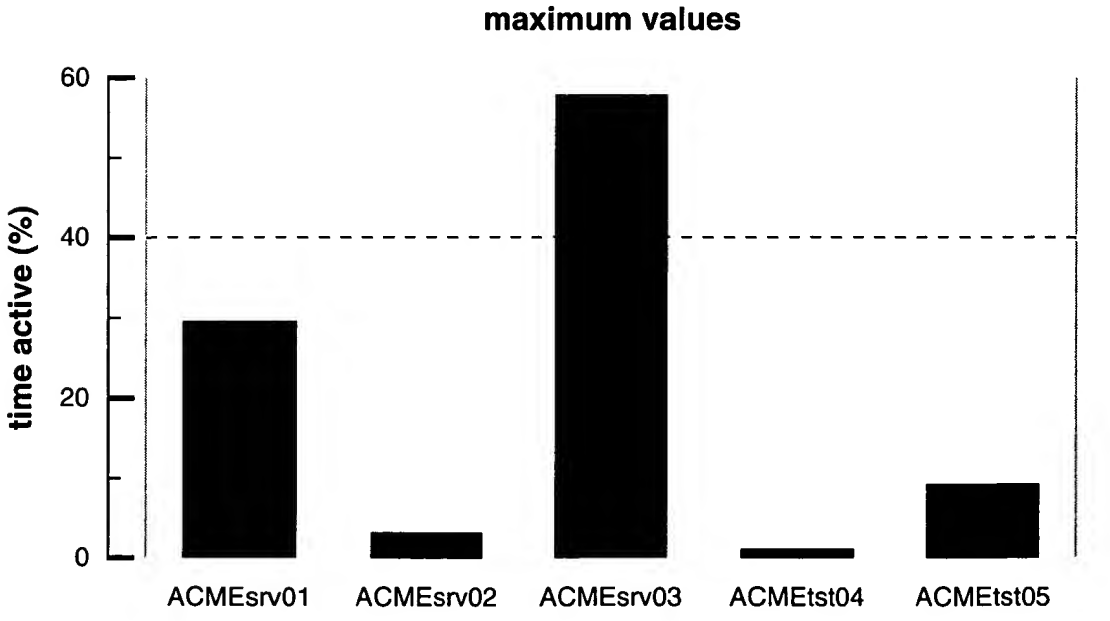




Disk Activity

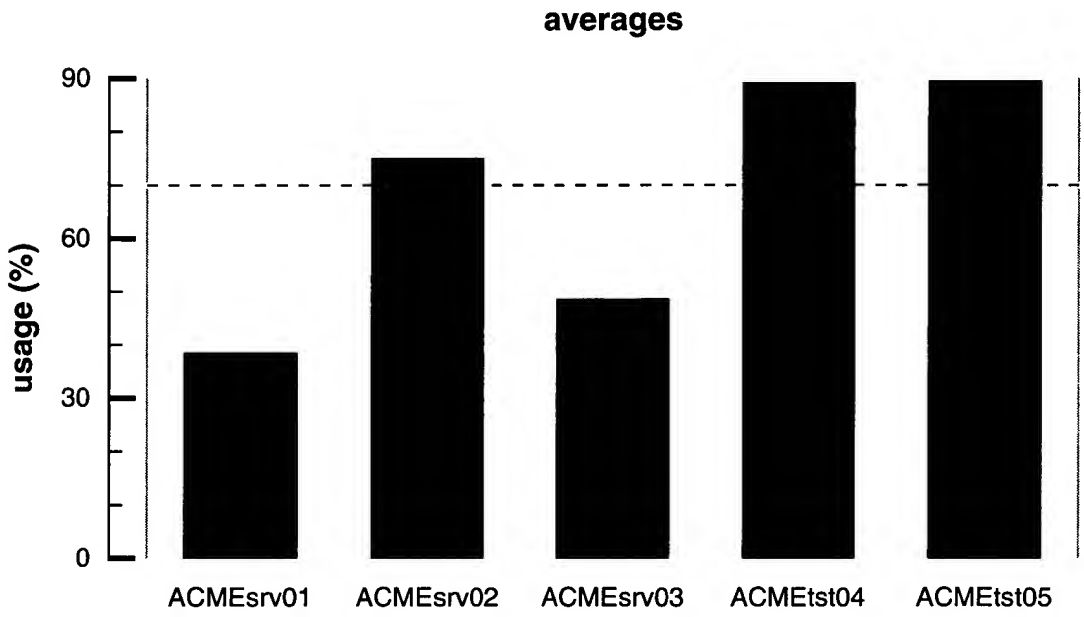
Each pair of graphs below represents the average and maximum values for the disk usage rate (time active) in the specified period.

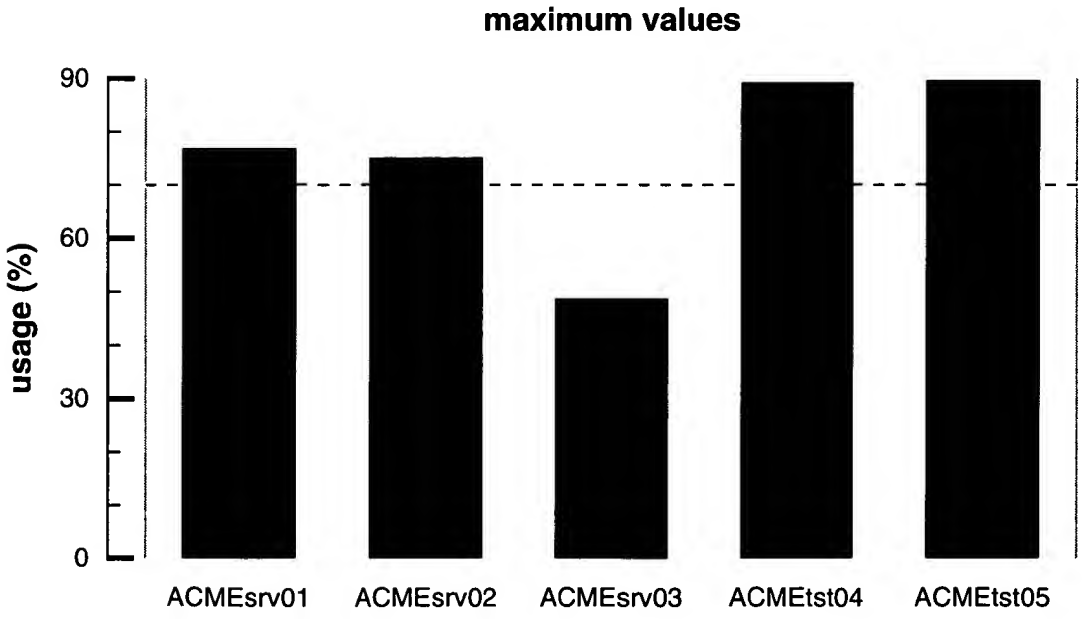




Disk Occupation

Each pair of graphs below represents the average and maximum values for the disk occupation in the specified period.





Processes which most consumed the CPU during the monitoring period

ACMEsrv01

process	usage
dataserver	21.10%
evoltps	19.82%
syncd	18.61%
java	6.74%
scopeux	4.50%
batchman	2.42%
gil	2.13%
dtgreet	1.19%
swapper	1.12%
hatsd	0.93%

ACMEsrv02

process	usage
xtcpnode	38.70%
dataserver	24.53%
syncd	6.87%
batchman	2.05%
scopeux	1.21%
gil	1.05%
hatsd	0.56%
backtrack_open_srv	0.53%
JOBMAN	0.53%
mailman	0.49%

ACMEsrv03

process	usage
join	76.51%
oserv	5.60%
jre	4.08%
gateway	1.92%
dm_ep_engine	1.63%
syncd	1.52%
ovtopmd	0.72%
tivoli	0.72%
tec_client	0.61%
dataserver	0.35%

ACMEtst04

process	usage
dsmserv	80.98%
syncd	3.33%
defragfs	3.25%
lrud	3.09%
tecad_logfile	0.65%
hatsd	0.49%
batchman	0.38%
backbyname	0.32%
gil	0.31%
nim_ether	0.23%

Top 10

ACMEtst05

process	usage
dataserver	31.50%
lrud	13.59%
xtcpnode	11.75%
syncd	9.58%
gil	1.61%
java	1.37%
sniff	1.02%
batchman	0.98%
einth0220	0.78%
dsmc	0.71%

List of Machines

Name	Model	Processor	Number of CPUs	Clock (Mhz)	Memory (MB)	OS	Version
ACMEsrv01	IBM,9076-270	PowerPC_POWER3	2	500	3,072	AIX	4.3.3.29
ACMEsrv02	IBM,9076-260	PowerPC_POWER3	2	750	2,048	AIX	4.3.3.16
ACMEsrv03	IBM,9076-260	PowerPC_POWER3	2	500	2,816	AIX	4.3.3.29
ACMEtst04	IBM,9076-260	PowerPC_POWER3	2	600	1,024	AIX	4.3.3.29
ACMEtst05	IBM,9076-260	PowerPC_POWER3	2	450	2,560	AIX	4.3.3.29

Performance Indicators

Name	Nominal SPECint95	Used SPECint95	Nominal TPMC	Used TPMC	Total Memory (MB)	Used Memory (MB)	Total Disk Space (GB)	Used Disk Space (GB)
ACMEsrv01	349.2	157.7	9,596.5	4,333.7	3,072	365	103	79
ACMEsrv02	349.2	279.4	9,596.5	7,676.7	2,048	390	112	84
ACMEsrv03	349.2	255.5	9,596.5	7,021.7	2,816	178	72	35
ACMEtst04	349.2	338.2	9,596.5	9,292.3	1,024	138	229	204
ACMEtst05	349.2	325.9	9,596.5	8,955.9	2,560	505	112	100
T tal	**1,746.4**	**1,356.8**	**47,982.6**	**37,280.5**	**11,520**	**1,576**	**628**	**502**